1: McGee E-5 (1894-1895)1898 NU31 Seri NU31

one of the huts. The condition of the remains and the various indications connected with the rancheria corroborated the tradition that the great creature had afforded unlimited and acceptable food for many moons; and various expressions of the tradition indicated that the event, though the most memorable of its class, was not unique in Seri lore.

A few bones and fragments of skin of the seal were found in and about the rancherias on Isla Tiburon, and an old basket rebottomed with sealskin was picked up in a recently abandoned jacal on Bada Ballena; a few bones provisionally identified with the porpoise (which haunts Boco Infierno in shoals) were also found amid the refuse about the old rancheria at the base of the long sand-spit terminating in Punta Tormenta; but nothing was learned specifically concerning the chase and consumption either of these animals or of the abundant sharks from which the island is named.

Among the exceedingly limited food supplies brought from the coast by the Seri group at Costa Rica in 1894, were rank remnants of partly desiccated fish, usually gnawed down to heads and tails; and Mashém and others spoke of fish as a habitual food, while Señor Encinas regarded it as the principal element of the tribal dietary. The harder bones and heavier scales of several varieties of fish were also found abundantly among the middens of both mainland and Tiburon shores in 1895. None of the remains bore noticeable traces of fire; and all observations, including those of Señor Encinas, indicate that the smaller varieties of fish are habitually eaten raw, either fresh or partially dried, according to the state of appetite at the time of taking—or the condition of finding when picked up as beach flotsam. But a single piscatorial device was observed, i. e., the barbed point and foreshaft, shown in figure 21—the iron point being, of course, accultural, and probably obtained surreptitiously. This harpoon, which measures 6 inches in length over all, is designed for use in connection with the main shaft of a turtle-catching tackle; and it is evidently intended for the larger varieties, perhaps porpoises or sharks. In 1827 Hardy observed a related device:

FIG. 21.—Fish-spearhead.

> They have a curious weapon which they employ for catching fish. It is a spear with a double point, forming an angle of about 5°. The insides of these two points, which are 6 inches long, are jagged, so that when the body of a fish is forced between them, it can not get away on account of the teeth.[1]

Don Andrés Noriega, of Costa Rica, described repeatedly and circumstantially a method of obtaining fish by aid of pelicans, in which a

[1] Travels, p. 292.

1: McGee E-5 (1894-1895)1898 NU31 Seri NU31

young or crippled fowl was roped to a shrub or stone, to be fed by his fellows; when at intervals a youth stole out to rob the captive's pouch. At first blush this device would seem to rise above the normal industrial plane of the Seri and to lie within the lower stages of zooculture, like the cormorant fishing of China if not the hawking of medieval Europe; yet on the whole it may be deemed fairly consistent with that cruel yet mutually beneficial toleration between tribesmen and pelicans attested by the preservation of the avian communal, as already noted. Moreover, Don Andrés observations are in accord with early notes of the exceedingly primitive aborigines of California, from whom the Seri have undoubtedly borrowed various cultural suggestions; thus Venegas quotes Padre Torquemada as saying:

> I accidentally found a gull tied with a string and one of his wings broke. Around this maimed bird lay heaps of excellent pilchards, brought thither by its companions; and this, I found, was a stratagem practiced by the Indians to procure themselves a dish of fish; for they lie concealed while the gulls bring these charitable supplies, and when they think that little more is to be expected they seize upon the contributions.

The padre says also of these gulls that "they have a vast craw, which in some hangs down like the leather bottles used in Peru for carrying water, and in it they put their captures to carry them to their young ones"—from which it is evident that he refers to the pelican. Venegas adds, "Such are the mysterious ways of Providence for the support of his creatures!"[1] And in the margin of his accompanying "Mapa de la California", he introduces a vigorous picture of a captive fowl, its free fellow, and the mess of fish, the cut being headed "Alcatrazes" (pelicans).

Despite these devices, the dearth of fishing-tackle among the Seri is evidently extreme. Save in the single specimen figured, no piscatorial apparatus of any sort was found among the squalid but protean possessions at the Costa Rica rancheria; neither nets nor hooks nor rods nor lines nor any other device suitable for taking the finny game were found in the scores of jacales containing other artifacts on Tiburon; while Señor Encinas was conversant only with the simple method of taking fish by hand from the pools and shallows left by receding breakers or ebbing tides. This dearth of devices is significantly harmonious with other Seri characteristics: it accords with the leading place assigned the turtle in their industry and their lore; it is in harmony with that primitive and nonmechanical instinct which leads them to rely on bodily strength and skill and swiftness rather than on extracorporeal artifacts in their crude and incomplete conquest of nature; and it is a manifest expression of relation with their distinctive physical environment—for the ever-thundering breakers of their gale-swept coast are abundant, albeit capricious, bringers of living grist, while the offshore gales at low tide lay bare hundreds of acres of shoaler

[1] History of California, 1759, vol. 1, p. 41.

1: McGee E-5 (1894-1895)1898 NU31 Seri NU31

smaller rodents, especially the long-tail nocturnal squirrel, are excluded from the Seri menu by a rigidly observed tabu of undiscovered meaning. A general consequence of this tabu is readily observed on entering Seriland; there is a notable rarity of the serpents, the high-colored and swift efts, and the logy lizards and dull phrynosomas so abundant in neighboring deserts, as well as of song birds and their nests; and this dearth is coupled with a still more notable abundance of the rodents, which have increased and multiplied throughout Seriland so abundantly that their burrows honeycomb hundreds of square miles of territory. A special consequence of the tabu is found in the fact that the myriad squirrel tunnels have rendered much of the territory impassable for horses and nearly so for pedestrians, and have thereby served to repel invaders and enable the jealous tribesmen to protect their principality against the hated alien. Seriland and the Seri are remarkable for illustrations of the interdependence between a primitive folk and their environment; but none of the relations are more striking than that exemplified by the timid nocturnal rodent, which, protected by a faith, has not only risen to the leading place in the local fauna, but has rewarded its protectors by protecting their territory for centuries.

In both the collective and the strategic chase, constant advantage is taken of weakness and incapacity, whether temporary or permanent, of the prospective quarry; so that diseased and wounded as well as sluggish and stupid animals are eliminated. The effect of this policy on the fauna is undoubtedly to extinguish the less capable species and to stimulate and improve the more capable; i. e., the presence of the human factor merely intensifies the bitter struggle for existence in which the subhuman things of this desert province are engaged. At the same time, the entrance of the human folk into the struggle characteristic of subhuman species serves to bar them from one of the most helpful ways to the advancement of their kind—i. e., the way leading through cotoleration with animals to perfected zoeculture. The most avidly sought weaklings in the Seri chase are the helpless young, and the heavily gravid dams which are pursued and rent to fragments with a horrid fury doubtless reflecting the practical certainty of capture and the exceptionally succulent tidbits afforded by the fetal flesh; naturally the cruel custom reacts on habitual thought in such wise that the very sight of pregnancy or travail or newborn helplessness awakens slumbering blood-thirst and impels to ferocious slaughter. To such custom and deep-planted mental habit may be ascribed some of the most shocking barbarities in the history of Seri rapine, tragedies too terrible for repetition save in bated breath of survivors, yet explaining the utter horror in which the Seri marauder is held on his own frontier. At the same time the hunting custom and the mental habit explain the blindness of the Seri to the rudiments of zoeculture, and clarify their intolerance of all animal associates, save the sly coyote that habitually

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224 [225] hides its travail and suckling in the wilderness, and perhaps the deified pelican.[1]

Parallel to the chase of the larger land game is the hunting of horses and other imported stock; for the animals are regarded in no other light than that of easy quarry. The horses of the Seri frontier, like those of wild ranges generally, are strongly gregarious, and the herds are well regimented under recognized leaders, so that the chase of their kind is necessarily collective on the part of both hunters and game; and the favorite method is for a considerable group of either warriors or women to surround the entire herd, or a band cut out from it, "mill" them (i. e., set them running in a gradually contracting circle) and occasionally dash on an animal, promising by reason of exceptional fatness or gravidness. The warrior's customary clutch is by the mane or foretop with one hand and the muzzle with the other, with his weight thrown largely on the neck, when a quick wrench throws the animal, and, if all goes well, breaks its neck;[2] while the huntress commonly aims to stun the animal with a blow from her hupf. In either case the disposition of the carcass is similar to that of other large quarry, save that thought is given to the danger of ensuing attack by vaqueros; so that it is customary to consume at once only the blood and pluck, and if time permits the paunch and intestines with their contents, and then to rend the remainder into quarters, which warriors or even women shoulder and rush toward their stronghold. Burros (which, next to the green turtle, afford the favorite Seri food) and horned cattle are commonly stalked and slain, or, at least, wounded with arrows, so that it is commonly the stragglers that are picked off; though sometimes several animals are either milled or rushed, and thrown by a

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[1] A single incident expressing the first sentiment toward travelling animals must be noted: a few minutes after the group shown in plate 37 was photographed, a starveling cur—a female apparently of nearly pure coyote blood and with a brood of two—shook toward the broken olla-bottle in the left center of the picture, in which a rank horse-foot was simmering; the women heading over the knoll suddenly straightened and shot out her foot with such force and directness that the cur was lifted entirely over the corner of the nearest jacal, and the poor beast fell stunned and moaning, a premature born pup protruding from her two-thirds of its length. The sound of the stroke and fall attracted attention throughout the group; the women smiled and grunted approval of the well-aimed kick, and a dozen children gathered to continue the assault. Partially recovering, the cur struggled to its feet and started for the chaparral, followed by the jeering throng; at first the chase seemed sportive only, but suddenly one of the smaller boys (the third from the left in the group shown in plate 37) took on a new aspect—his figure stiffened, his jaws set, his eyes shot purple and green, and he plunged into the lead, and just before the harried beast reached cover he seized the protruding embryo, jerked it away, and ran off in triumph. Three minutes afterward he was seen in the shelter of a jacal greedily gorging his spoil in successive bites, just as the Comanche boy devours a peeled banana. Meanwhile, two or three mates who had struck his trail stood around begging bites and smoking at obscene blood spatters on earth, skin, or tattered rags; and as the victor came forth hale, licking his chops, he was met by half jocular but admiring plaudits for his prowess from the dozen matrons lounging about the neighboring jacales. Parallel instances, both observed and gathered at second hand, might be added in numbers; but this may suffice as the data specific basis for the generalization which places the Seri below the plane of possible nomadism—a generalization so broad as to demand ample record of data which it would be more agreeable to ignore.

[2] This warrior's clutch, and the notion that it is discreditable if not criminal for the nonwarlike adult to take recourse to weapons in hand-to-hand slaughter, are strongly suggestive of nonsexual motives and of studied mimicry of the larger carnivorous, such as the jaguar—the "mark-imitate" of the Maya.

1: McGee E-5 (1894-1895)1898 NU31 Seri NU31

171 726 measure; so that the Seri frenzy is at once more instinctive and more fortuitous, or in general terms more inchoate, than the corresponding condition among most of their contemporaries. Accordingly the war customs, like several other features of the tribe, seem to afford a connecting link between the habits normal to carnivorous beasts and the well-organized war customs of somewhat higher culture-grades; and thus they contribute toward outlining the course of human development through some of its darker stages.

712 Conformably with their poverty in offensive devices, the Seri are exceedingly poor in devices for defense. It is an impressive fact that a restricted motherland which has been successfully protected against invasion for nearly four centuries of history should be destitute of earthworks, fortifications, barricades, palisades, or other protective structures; yet no such structures exist on any of the natural lines of approach, and none are known anywhere in Seriland save in a single spot—Tinaja Trinchera—where there are a few walls of loose-laid stone, so unlike anything else in Seriland and so like the structures characteristic of Papagueria as to strongly indicate (if not to demonstrate) invasion and temporary occupancy by aliens. The jacales are not fortified in the slightest degree, unless the turtle-shells with which they are sometimes shingled be regarded as armor; even the most ancient rancherias are absolutely devoid of contravallations of earth, stone, or other material; and both the structures themselves and the expressions of the folk concerning them indicate that the jacales are not regarded as fortresses or places of refuge against enemies, but only as comfortable lodges for use in times of peace. Nor are walls like those of the borderland Tinaja Trinchera known in the interior of the tribal territory—e. g., the similarly conditioned Tinaja Anita, which differs only in the greater abundance and permanence of the water-supply, is entirely devoid of artificial structures, not even a pebble or bowlder being artificially placed save perchance by the casual trampling of the pathways. As already noted, the Seri seem to be practically devoid of knife-sense; they are still more completely devoid of fort-sense, although (and evidently because) they rely so fully on natural things, including tutelaries and their own fleetness, for safety.

713 Although devoid of even the germ of fortification-sense, so far as can be discovered, the Seri are not without a sort of shield-sense, which is of much significance partly by reason of its inchoate character. The ordinary shield is a pelican pelt, or a robe or kilt comprising several skins; it is employed either for confusing the enemy by swift brandishing, something after the fashion of the capa of the banderillero in the bull ring, or for actual protection of the body against arrows and other missiles or weapons. So far as known it is not backed or otherwise strengthened, the user relying solely on the stout integument and [825] thick feathers—or rather on the mystical properties imputed to the pelt as the mystery-tinged investiture of their chief creative tutelary.

1: McGee E-5 (1894-1895)1898 NU31 Seri N731

On the coast bucklers are improvised from turtle-shells, though, according to Mashém (confirmed by direct observation), these are not carried inland for the purpose; but the protective function imputed to the turtle was well represented in the rancheria at Costa Rica by several fetiches made from phalanges of turtle-flippers tricked out in rags in imitation of Caucasian dress (somewhat like the mortuary fetiches illustrated in figure 40*a* and *b*). On the whole, the most conspicuous feature of the individual shields or protectors is their emblematic character; they are sortilegic rather than practical, and express imputation of mystical potencies rather than recognition of actual properties; and in this as in other respects they correspond closely with the offensive devices, and aid in defining the ideas and motives of the primitive warriors.

The actually effective protection of the Seri in warfare is their fleetness, coupled with their habitual and constitutional timidity, i. e., their wildness—for they are verily, as their Mexican neighbors say, "gente muy bronco". Moreover, they are adepts in concealing their persons and their movements behind shrubbery and rocks, and in finding cover on the barest plains; and suggestions are not wanting that the protecting shrub-clumps and rocks of their wonted ranges are credited with occult powers and elevated to the lower places of their zoic pantheon, after the customary way of that overpowering zootheism, or animism, which the Seri so well exemplify in many of their habits.

Summarily, the warfare of the Seri complements the pacific industries of the tribe in every essential respect. It is notable for improvidence, i. e., for reliance on chance; the dearth of devices for offense and defense parallels the poverty in industrial artifacts; and the disregard of fortifications is of a kind with the squandering of present food supplies and the utter neglect of provision for the future. A striking correspondence between workfare and warfare is found in the fierce blood-lust displayed alike in chase and battle, a feature manifestly borrowed from beasts and intensified by besetting beast-faith; and more striking still is the correspondence in motive, as revealed by the overlapping functions of the protective kilt, by the borrowing of animal symbols alike in peace and war, and by the imitation of animal movements on the warpath as in the chase.

In the last synthesis the warfare of the Seri may be considered as characterized by two attributes: (1) The motives, so far as developed, are zoomimic in even greater degree than the prevailing motives of the pacific industries; and (2) the methods are shaped largely by mechanical chance, like those normal to protolithic industry.

Nascent Industrial Development

Industries form the chief bond between man and his environment. The esthetic activities arise in the individual and extend to his fellows; the institutional activities express the relations among individual men

SERI ETHNOECOLOGY: A PRELIMINARY REPORT[1]

Boryx Malkin

121 In this paper I shall attempt to summarize briefly some of the possibilities inherent in ethnoecological studies. Ethnoecologies, published so far, have either stressed only the economic or medicinal uses of animals or have just included them as part and parcel of mythology and religion. The emphasis here, on the other hand, is primarily on the aboriginal knowledge of natural history and naturalistic concepts about animals. A comparison with the actual situation in nature will be frequently made in order to test the acuteness of the native observation.

This account is part of a wider comparative study in ethnoecology of several aboriginal groups. Additional field work has recently been completed among two other tribes, the Cora in Nayarit, Mexico, and the Sumu in northern Nicaragua.

Ethnoecological studies of such scope require much more extensive background in natural history than anthropologists or even ecologists today are likely to have. One has to deal with very diverse groups of animals and I have found my own knowledge of the subject repeatedly inadequate on many occasions. It is hoped that a study of this sort will attract individuals who will cover more satisfactorily the entire range of the animal kingdom.

Economic Uses

825 262 439 Almost all major classes of animals, with the exception of the insects, are used for food. Only a very limited number of species serve other purposes such as trade with the Mexicans. Among these are various species of large fishes, sea-turtles and a number of shells. Some are used for the basic non-dietary products such as utensils, clothing, and other items of the material culture, for these are purchased ready-made in the local Mexican "tiendas" (small general store).

925 [illegible] As a major source of income for their livelihood the Seris depend mainly upon a few commercially significant species of large fish and sea-turtles. Yet they do exploit a wide range of the animal environment as a source of additional food. Of the total number of species of animals[2] upon which information has been available, 45% were reported as economically exploited. The table below gives the breakdown of the major groups.

[p. 73]

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Class	Species Reported	Species Exploited	Percentages
Mammals	21	2	
Birds	24	6	
Reptiles and Amphibians	25	11	
Fish	43	23	
Molluscs	36	21	
Crustaceans	10	2	
Total:	160	72	45

These figures show clearly the dependence of the Seris on marine life for a major source of their diet. Today, pinta, bays, cabon and sardinera are their primary source of income with meat and sea-turtles ranking second in importance. Several species of clams, limpets and gastropods supplement this diet.

All other animals represent only incidental additions to the menu. During the last war, sharks and mantas were hunted extensively for their liver, then a source of vitamin D. But since the war, the demand for shark liver has declined and because of this, a considerable income for the Seris has been lost. Shark and manta fishing have been abandoned for these fish were taken only for the commercially profitable liver and not for their flesh.

Fishing and Hunting

Seri fishing techniques are simple. In the past they used double-pronged spears and for the larger fish, harpoons. Today the spears are employed chiefly in fishing while the harpoons are reserved exclusively for sea-turtles. Hook and line fishing was introduced after 1930, as Kroeber (1931) saw none during his visit to Kino in 1930, and it is now the standard method of fishing. An abortive and unsuccessful attempt was made several years ago with net fishing. Another change has occurred within the past fifty years. The old balsas have been replaced by flat-bottomed plank boats outfitted with five-horsepower motors or sails. These motors, incidentally, are leased from the Mexican fish traders because none of the Seris are rich enough to own one.

Bait is obtained by dynamiting schools of small fish in coastal waters or by collecting them at low tide in the tidal pools and from under rocks. Fishing usually begins at dawn and lasts until noon when, as a rule, all of the "pangas", as the boats are called, return to Desemboque. In stormy weather no fishing expeditions are made and when this occurs, starvation becomes a real menace. Harpooning of sea-turtles takes place far out in the Gulf. It is done only at night in exceptionally calm weather by the light of torches or Coleman lanterns.

Hunting as it is done today has changed from the time of McGee's visit in 1894-95. The bow and arrow has disappeared completely except for a crude and diminutive form used as a toy by small boys. Iron spears once used in shark and manta hunting are now carried primarily as a weapon against the numerous and much feared rattlesnake. They are said to be used occasionally in the peccary hunt. Old .22s or 30/30 rifles are owned by several of the men, some of whom specialize in hunting.

224 Game pursuit is usually done on foot, mostly in the winter and very little in the summer. The intense heat of the desert in the summer makes hunting unattractive. The most frequent trophies are the Sonoran bighorn, peccary, cottontail and jack-rabbits. Sometimes, semi-wild burros, running loose on the adjacent extensive Mexican "rancherias", are poached for meat. The peccary is the only animal hunted with the aid of dogs. Large rodents are dispatched by [223] sling-shot, stick, stone, or shot with a .22 caliber rifle. Birds, such as sea- [411] gulls, ducks and pelicans, are clubbed, stoned or shot with a small caliber rifle.

462 While fishing and hunting are primarily men's occupations, the gathering 224 of the terrestrial and marine animals is almost exclusively women's work. 226 Rattlesnakes and other reptiles are often killed and brought to the encampments by the women from their morning trek into the desert after firewood and fruit. Small fish and marine invertebrates in the tidal pools are collected by women, aided by children of both sexes.

252 Preparation of meat is quite simple. It is either boiled in hot water with salt added as the only seasoning or else roasted whole, if small enough, over an [263] open fire with or without a grill. The use of spices such as tomato sauce, chili, peppers, and the like, depend upon the tastes of the individuals and also upon the availability of money.

● 225 In individual competence as hunters or fishermen the men show a great deal 224 of variability. Some excel in fishing while others do so in hunting. Hand in 226 hand with this, goes the degree of knowledge of the local natural history and, as expected, the best fishermen lead in the knowledge of fishes while the best hunters possess the most extensive knowledge of terrestrial animals and insects. It has also been observed that boys were far ahead of adults in their knowledge of inconspicuous or otherwise commercially unimportant creatures such as insects, obscure marine invertebrates and small fishes. Interest in the commercially or otherwise economically important forms of animals unquestionably becomes overwhelming in adult life while much of the natural history lore learned in youth is forgotten.

Food Preferences and Taboos

262 A number of animals were reported as being a part of their diet in the past but which were not used at the present time. Several species of shells collected from kitchen middens along the coast were thus identified. In some instances it has been denied that a certain animal was used for food; yet, later when such a beast was brought to the camp, it would be added to the menu. Undoubtedly, some of the species were held in low esteem as food and the Seris preferred not to admit eating them.

Large fishes, especially pinta and baya, sea-turtles, and the very large chuckawalla lizard, which is brought back from rare expeditions to San Esteban Island, are the preferred cuisine. Cochi fish, also called puercos, are disdained. Large catches of these were frequently brought in from the sea, only to be unceremoniously dumped on the beach and left to the dogs and the vultures. But when other fish were scarce, the puercos were eaten. Pelicans, once an

important source of meat for the Seris, and sea-gulls are occasionally killed and likewise abandoned, except when famine threatens. The above examples most likely apply to other varieties of animals as well.

No specific food taboos were discovered in the course of field work except the unexplained reluctance to eat certain species. McGee (1898) reports a taboo on eating sea-lions but my informants asserted that these mammals were hunted in the past for both their flesh and hide. All of my informants denied that the Seris eat cougars, and this abhorrance has been confirmed by the Mexicans. Yet the Mexicans themselves do hunt and eat these big cats. McGee (1898:196, 202) again casually mentions cougars and jaguars as being hunted by by the Indians but gives no evidence for this. It should be mentioned that only a few Seris know what sort of an animal the jaguar is, and these know it only from hearsay as "huge animal inhabiting the mountains far in the interior". There are occasionally some migrant jaguars in Seri territory.

Pets

The Seris have only a limited variety of pets. Dogs are very numerous, each family keeping many of them. Although they maintain that the dogs are acquired in order to keep the coyotes away from the camps, there is nothing in their camps that a coyote would want to steal. There are a few cats and several species of wild desert doves which are often caged. Wild animals in captivity are, as a rule, those which accidentally come into the hands of the Indians. On one occasion a badger was kept tied to a house post for a couple of weeks and fed on fish heads, snakes, lizards and water until one night when it made its escape.

Of the insects, only the singing male Cicadas are captured by the roving Seri boys. These are tied to a long thread and having their fore-wings partly clipped, they are released into the air like kites. Local Mexicans also provide a similar kind of toy for their children.

Classification of Animals

Seri taxonomic notions of the animal world are vague and indistinct. No conscious classification exists and perhaps none should be expected of non-literate people. But there is a random association of animals based on the external similarities of form, habits and habitat. A clear distinction is made between plants and animals. Quite obscure animals, for example, the Echinoderms, Holothurians, Coelenterates or barnacles, are classed as animals and not as plants. It seems that voluntary movement is used here to distinguish the two categories. Thus, informants insisted that sea-anemones and jelly-fish are animals and not plants. One difficulty arises in the case of sessile barnacles. It is hard to account why those growing on the sea-turtles are classified as animals and are called "turtle fleas".

In the assemblage of major animals, the mammals form one group and birds and fish others. Since general similarity of form and not real structural affinities are the primary reason for these associations, the bats "are not birds, but are probably mammals because they have fur". Thus, sharks and

mantas are classed together and separate from the fishes while whales and dolphins represent another group; the latter two being considered as neither mammals nor fishes but as a category of their own. Yet, in many instances, especially in dealing with the smaller categories, natural affinities are placed together as is well shown in the case of many insects. For example, tiger beetles of the genera Tetracha and Cicindela are called by the same name, kʷo-pe. Some of the Buprestid and Tenebrionid beetles also share a common name. In general, for the insects, similarity of shape, color, pilosity associated with the similarities of the habitat, behavior and particularly similarities of movement suggested natural affinities. This is very clear from the association of the two different kinds of tiger beetles in which the determining factors are the type of flight and running behavior plus the type of habitat in which both happen to live.

Sex Differentiation

All animals are said to have both the female and the male sexes, although it is not always possible to tell them apart. In almost half of the total number of species for which information has been obtained, the informants were unable to tell whether the sexes were different or alike in appearance. This proved to be particularly true in the case of insects. Of the remainder, in more than sixty cases, specific individual traits were given for the distinguishing of the two sexes. In most of these, the males are said to be larger than the females, which is actually the case. Another generalized trait of this sort was the supposedly darker coloration of the males. An analysis of these responses and a comparison with the actual sexual differences revealed that this was most likely a cultural pattern in operation and not a result of direct observation. This is certainly the reason why several pairs of different insects belonging not only to different genera but also to different orders were classified as being a male and female of the same kind. Thus two different Scarabeid beetles of the genera Ligyrus and Cyclocephala were considered the same, with Ligyrus being the larger and darker of the two, it was identified as the male. Informants also guessed that the male of the American Cockroach was darker and larger, not knowing that the female is quite different in appearance in being wingless. Confronted with several specimens of the grasshopper, Anconia integra, the informants suggested that the largest of them was a male. In another instance, the darkling beetle, Endrodes vendricosus, was described as being the female of Arenivaga, a round roach, the smaller size of the beetle suggesting femaleness. But these examples do not exhaust the multitude of ways in which the Seris distinguish between the sexes.

For the land mammals, one of the standard characteristics distinguishing them was said to be the presence of "dos hueves", literally "two eggs", in the male. For the kangaroo rat it is the protruding penis which denotes the male, while for the bighorn it is the presence of larger horns. In the mule deer it is only the male that has horns and then only seasonally. An interesting attempt to generalize sexual differences in several species of lizards was made. Informants first searched for "ridges" on the ventral side of the femora, which supposedly denote the males. This, however, is a trait typical of separate genera of lizards and not of the sexes. But if here they have failed to uncover actual sexual differences, they have succeeded in the case of the gridiron-

tailed lizard, Callisaurus draconoides insulitans, in which the males have blue abdomens, this fact being quickly pointed out by the informants. This association of more colorful pattern with the male was applied to several of the molluscs and to many of the fishes. In the fishes, another and standardized sexual distinction has been given; the males being longer and narrower and less bulky than the females. More specific characteristics have been given in sexing sharks and mantas. Here the males are said to have "two penises" near the vent. Indeed, they do have two claspers which are absent in the females. Interestingly, no sexual differences were given concerning birds. The informants simply could not tell the female from the male bird. This is not surprising at all for in most birds sexes cannot be distinguished without dissection.

Knowledge of Habitats

Habitat distinctions are sharply impressed upon the Seris. They are well aware of the fact that various marine animals and terrestrial animals have strong preferences in this respect. They know that some of the marine animals prefer deep waters while others prefer shallow water and that some will be found on sandy bottoms and others on rocky bottoms. They also know of similar preferences among the terrestrial animals; some being partial to the proximity of fresh water, others to sandy beaches, some to the mountains and others to the desert. This knowledge is frequently exact and often extends to quite small and inconspicuous creatures. Presented with Hydrophilus insularis, a large water beetle, the informants unhesitatingly gave its name as ?ax-hahak, the prefix ?ax meaning water. They indicated also that it lives in fresh water. Yet this beetle is extremely rare in the locality, only one specimen having been seen and captured in the course of my field work. A giant tarantula-hunting wasp, Pepsis, was also said to live near water and its name has been given as ?ax ?ax . These tarantula killers indeed do often congregate near water. The tiger beetles were invariably associated with the "playas" and marine beaches, even when the informants were not told where they were captured and when they came from localities distant from Desemboque.

Likewise, the nesting grounds of egrets in the mangrove mud flats of the Estero Sargento, an estuary south of Desemboque, were correctly associated with the mud where these birds find an excellent feeding ground. In giving the distribution of the coastal animals, the informants often indicated their presence or absence at Porto Kino or Desemboque, stressing that the sandy sea bottom at Porto Kino and the rock sea bottom at Desemboque accounted for this fact. This is especially true of many fishes which prefer one or the other of these two habitats.

Seasonal Differences

The seasonal turnover in Sonora from winter to summer is very great; the summers being extremely hot and the winters quite chilly. This was particularly stressed by the informants in relation to reptiles and insects which are not much in evidence during the cold season. Most mammals, on the other hand, were indicated as equally numerous in both seasons. The fishes, accordingly, migrate a great deal. Most important commercial species were said to travel north in the spring and to return south in the late fall. Similar migrations were

ascribed to whales. Some of the Birds are supposed to be migratory, but the direction of their migration is a mystery to the Seris. The swallows "pass in great numbers" but that is all that was known about them. The ducks winter on Isla Patos and then depart for the north in the spring without ever laying any eggs. Hence, their eggs were totally unknown to the informants. Egrets are said to remain in Estero Sargento for the winter.

Sometimes seasonal differences in the appearance of an animal were noted; for example, the loss of horns by the male mule deer during the winter. Seasonal differences are more sharply impressed upon the Seris than on either the Cora or the Sumu. This is not surprising because seasonal changes in Sonora are more contrasting than in either Nayarit or Nicaragua.

Age

The Seris find this feature of animal life the most difficult to ascertain. Hardly any responses were given that could be correlated with the actual length of life. Most replies were standardized according to the individual notions of the informant, such as "4 or 5 years", "about 6 months", and so on. In general, the larger the animal the greater the longevity attributed to it. In many cases it has been suggested that "perhaps the animal dies with the beginning of the cold season". This was frequently said especially in regard to reptiles. There is very little understanding of reptile hibernation through the winter.

Transformation and Immature Stages

No generalized idea of the transformation or metamorphosis of one kind of animal into another has been discovered, with the exception of two instances among the insects. Maggots are correctly associated with flies, but this is not surprising in an encampment where untold millions of them infest offal and other remains. It is also possible that this idea came to the Seris by way of the more sophisticated Mexicans. A hawk moth larva, found in great numbers on the jimson weed, was said to turn into a butterfly within 10 to 20 days if it rained, but if the rains failed, it would continue in its larval stage. These two unconnected cases represent the total knowledge of insect metamorphosis discovered in the course of my field work.

In other animals, the immature individuals are always described as being similar to the adults except for their smaller size. In addition to this, the young of several of the birds were supposed to have differently colored plumage.

Nocturnal and Diurnal Variation

As expected, there is very little knowledge of the activity of fishes, but there is a great deal of accurate knowledge of these phenomena for the mammals, many birds and reptiles. By way of illustration, rattlesnakes and most other snakes are reported as coming out at night and resting in the ground during the day, whereas the opposite is noted for the lizards. They are most active in the brilliant sunshine and go into hiding at night. For many mammals, decreased activity was noted during the day. Peccary, coyote, deer and cottontail were some of the mammals listed.

Food Habits

The food habits of all but a very few of the insects are totally unknown to the Indians but they do have accurate and detailed knowledge of the food habits of fish. This is probably due to the great economic importance of fish to the Seris. They also have very full data for the mammals, including bats, which are said to be insectivorous. The responses varied concerning lizards and often did not parallel the situation in nature. In some instances, the acuteness of the observation was remarkable. Thus, the Northern Crested lizard, Dipsosaurus dorsalis somorensis, which occurs on the sands of Rancho San Francisco, inland from Desemboque, has been mentioned as climbing trees after fruit. Even more unusual, the leopard lizard, Crotaphytus wislizeni, was said to feed on other species of lizards. And indeed, it is one of the very few species of lizard in the region which habitually devours others of its own kind.

Mating Seasons, Eggs and Nesting

In most of these aspects of natural history the native information is quite deficient. In the case of birds, it is assumed that mating occurs in early spring, that the eggs are laid a month later, that in another month the young hatch out and about the third month they fly from the nest. This sequence seems to represent a conventionalized idea rather than a reflection of direct observation. Another difficult question for them to answer, with respect to the reptiles, was whether the young are born alive or whether they hatch from an egg. Only a few of the species are correctly described, among them the rattlesnakes. Sharks and mantas are said to give birth to live young.

Guesses as to the number of eggs varied from fairly accurate estimates for some of the birds to rough approximations ("many") for some of the reptiles and most of the fishes. The knowledge of bird nesting habits was fair. The informants had no difficulty in pointing out the particular localities where one or another species of bird nests nor in the identification of the nest by its shape and construction. This was especially true of the cormorants, egrets, sea-gulls and pelicans. All these are either marine or shore birds as will be noted.

Animals: Venomous and Otherwise Feared

In contrast to the Mexicans, the Seris fear relatively few animals and they are almost always those which can inflict a vicious or toxic bite or sting. The Mexicans, on the other hand, are afraid of a great many animals. European folklore plays a part in this as does unfamiliarity with the desert and the consequent fear of it.

The Seris fear most the rattlesnake, both the Western Diamondback and the Sidewinder. These snakes, they say, bite with their fangs but the venom is located in the rear of the body, about two inches in front of the anus. A plant called "hueco" (?) is used as a remedy both in the form of a drink and as a dressing for the wound. The Mexicans claim this remedy is effective. The coral snake is also considered to be venomous although the Seris believe that its bite is fatal only to Mexicans and not to themselves (!). Most of the

other snakes are also viewed as venomous but are claimed to be of mild disposition and do not bite people.

Among the lizards, curiously, the one feared most is not the highly poisonous Gila Monster, but the harmless little gekko, Coelonyx variegatus concrensis, which lives in fallen and dried-up saguaros. The informants could not even be induced to touch specimens killed in alcohol. It is believed that this creature could kill humans either by contact or by allowing them to inhale its vapors which cause a fatal lung illness. This little lizard is reminiscent of the European salamander in some ways. The Mexicans call it locally "salamancesa", and attribute to it the same unpleasant traits which the Seris do. Since this little lizard does resemble the European salamander and the beliefs about it are quite similar to those in European folklore, it is possible that here is a case of a transfer of this folklore upon an animal of a different kind. These beliefs eventually perhaps diffused to the Seris.

A small desert night lizard, Xantusia vigilis, is also very much feared and is frequently confused with the gekko. It lives in an identical habitat. A toad, Bufo alvarius, is said to bite with its tongue and is supposed to be able to inject venom with it. Its blood and "milk" are also very toxic.

Several of the arthropods are believed to be dangerous. The Seris claim that the blood sucking cone-nosed beetle, Triatoma rubida, stings with its mouth parts and also causes an illness called cyxhil'i ve kmop, which can be fatal to children. This bug actually is a vector of the Chagas disease and its repeated bites may cause a sensitization to them. But in this case it is impossible to tell which is the situation without a clinical analysis. Scorpions, which sting with their tails, are considered to be very dangerous. The Black Widow spider, which is very numerous in the locality, is also viewed as very toxic and is said to be sometimes fatal, although a few days' illness is all that its bite usually causes. The tarantula spider also bites but its venom is never fatal. The Sun spiders, Soliphugida, are venomous but their venom supposedly kills horses but not people. All of these spiders and their relatives, according to the informants, sting with the rear end of their body in wasp-like fashion. No medicant is applied on the bite, nature being allowed to take its own course in the recovery.

Concerning other animals, the sting rays are much feared because of the venom in their thorns and their ability to inflict a nasty wound. The bats, according to some informants, can cause disintegration of the body by spitting on it and they also have venom in their tongues, although this belief was not shared by one of the more sophisticated informants.

Only a few animals are considered to be dangerous to eat owing to their toxicity. The toad is one and a little fish, Sphaeroides annulatus, is another. Of this fish it is said that "one hundred years ago, a man ate one; he died", hence the avoidance. However, rattlesnakes are eaten with relish; only the head and the part of the body where venom is believed to be located being discarded.

The above discussion suggested some of the differences in the attitudes toward animals between the Mexicans and the Seris. While the former fear many,

the latter are largely unconcerned with by far the greater majority of them. If there is any magical importance attached to any of the species, it has not been discovered in the course of this field work and this fact has been corroborated by other recent observers.[3]

Summary

Extensive field work of this sort has many ramifications. One of the main items investigated has been the acuteness of the native observation of animals. In the case of the Seris, this knowledge progressively increases both in volume and in accuracy with the increasing economic importance of the group. The mammals and large fish are the best known followed in order by birds, reptiles, smaller fish, insects and marine invertebrates. It is also obvious that local ecology, habits and anatomy of the various species of animals set definite limitations upon observation. Lack of understanding of the hibernation of reptiles through the winter is a case in point. Another example is in the Seris' inability to distinguish between the sexes of birds. Purely cultural factors are also potent as can be seen in the standardized responses to the questions about the age of animals and the development of birds. Seri knowledge of animals is remarkably free from mythology, although a number of animals are known to have had mythological significance in the past.

There is little fear of animals except of those which are actually dangerous.

An interesting fact emerges from the comparison of the particular aspects of the knowledge of natural history. Namely, that this knowledge is not always symmetrical in that some facets of natural history are far better known by the Seris than others. An excellent illustration is provided here in the complicated ways of sexing animals, in their extensive knowledge of the food habits of some of the animals and their ecological environment, and by their very limited ability to guess correctly the age of animals.

Not all of these differences can be accounted for in natural terms and it is suggested that the answer to this asymmetry lies, perhaps, in the cultural factors unaccounted for in this study. In spite of their dependence upon a relatively few economically important species of animals, the Seris do make use of much of their animal environment in their diet, as would be expected of a marginal people who still live today in a fishing and gathering economy.

FOOTNOTES

1. This field work was made possible by research grants from the Department of Anthropology, University of Washington. Most of the work was done in Desemboque, Sonora, during the summer of 1953 with some additional work there in May 1955.

For much help in carrying out this field work I am indebted to my friend, Leo Sandoval, a school teacher in Desemboque.

2. In addition to these 160 species of animals, data has been obtained on more than 100 species of insects and their terrestrial allies, none of which are eaten.

3. Edward Spicer and William Smith, Jr., in verbal communication.

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/For detailed information on Seri beliefs about native animals, see category 116, pp. 10B-16B, 17B-46B, 47B-57B, 61-68.

124 Seri alike, is acquainted (Cougar, Jaguar, Whale, etc.) questioning had been done by referring to such and such beast without the use of pictures or actual specimens. This procedure had been followed for the majority of mammals, which are well enough known in the area. But otherwise, questioning had been done with actual specimens in hand, alive where possible. This was owing to
●[825] the fact that response may be different to the dead specimens than to the live ones and grew out of a conviction (entirely substantiated in the course of work) that many animals, of a small variety especially, are recognized more by their distinctive behaviour pattern, flight, selection of habitat, voice, running posture, etc., than by the shape and form alone. All invertebrates, all reptiles and all but the best known and largest fish had produced the data from actual specimens, dead or alive. Finally, where neither common colloquial name nor specimens were available, I resorted to pictures. That way I obtained data for a small number of animals and for a good many birds. This method has its weakness. The line drawings in the excellent guide to the *Birds of Mexico* by Blake I used are somewhat on the "dead" side and may be good aid in bird identification to someone who also will read the text, but they often fail to be of much use to someone who rarely has seen the drawings in any book, let alone a bird guide. From the replies it was obvious that a certain amount of misidentification took place in the naming of the birds or mammals from the sketches. I took account of this and eliminated from consideration all those forms where misidentification on the part of the informant was obvious. This in itself may be a worthwhile object of study but it was not my concern at the moment.

In working with the informants I studiously avoided giving them any suggestion that I already knew what the animal was or that I had a fair idea about the general features of its natural history. This is especially important in considering the Seris' knowledge of the animal distribution, ecology and other salient features. When available, I often brought along specimens of species I knew did not occur in Desemboque which had been captured elsewhere, in the absence of the Seris. This was in order to test better their recognition of animal forms.

115 Altogether 10 informants had been used. Of these the bulk were questioned in 1953, some again in 1955 and that year Chico Romero, now an old man of over 70, had been also added to the roster. Chico was Kroeber's star informant in 1930 and from him came the bulk of Kroeber's original information.

The two main informants were Miguel Barnett, then aged about 45 and one of the Seris' best hunters, and Jose Juan Moreno, a fellow about 25, recognized as their best fisherman. As expected, their preoccupations and interests slanted their replies. Accordingly, Jose Juan had the best knowledge of the marine animals and Miguel of the terrestrial animals. Jose Juan aided me again with some information in 1955.

[165] Other informants were as follows: Juan Torres, aged 40 or so; Ramon Montayo, one of the

[P. 4B]

115 [165] oldest Seris then alive of over 70; Ramon Corrales, claiming to be 37 and on the dim-witted side; Jesus Montanyo, a quiet, cooperative man of 21; Natcheo Molina, aged 35 or so, whose interest in the protestant hymnals was unfortunately far greater than in giving me the information I wanted; Jose Manuel Romero, about 37 years old on his own claim; and Jose Barnett, Miguel's son, aged 14. Inclusion of young Barnett was a lucky ● 825 strike because it indicated clearly differences in the natural history knowledge between the older men and the young men, later confirmed also in the incidental questioning of several young boys. [868] Young men start out with general interest in animals of all sorts, including the small invertebrates, but as they grow up they end up with solid knowledge of economically important species and slim, forgotten knowledge of the insignficant invertebrates.

124 I made an endeavor to obtain the same sort of information from several informants in order to eliminate as far as possible aberrant answers or peculiarities. The most solid information is available for the mammals, which are, of course, well-known. Here in some cases the same kind of information had been obtained from five individuals. In other instances only two to three were available and sometimes only one. What was surprising about the information given were not the differences, which I often indicated in the text, but the amount if identical agreement on almost every single item of data between different individuals.

Since it was impossible to obtain information on all animals from the same individuals, the questioning proceeded in "blocks." By this I mean, I would question for example two individuals about the entire order of mammals (every species of them) and another two on the birds. Two other individuals then would be questioned on half of the birds and half of the mammals, while the other two on half of the reptiles and half of the fishes; still another two on half of the insects and half of the marine invertebrates, while others would yet cover all of the insects or reptiles or fishes independently. This I believe is a useful procedure. It allows to test generalized concepts of natural history for several individuals for diverse groups. It is motivated by the question of no little importance. What does so-and-so know about mammals and what does he know about birds? What are his generalized ideas of each group? It [825] had been soon discovered that when it concerns special points, the informants were apt to have standardized notions of what the animals did, regardless of the actual situation. The less actual observational knowledge they actually had, the more frequent were pat replies. Obvious demonstration of this helped a great deal to eliminate such pat answers or to recognize them for what they were and to account for them in the final analysis.

ooo Another point in the procedure is of par-

[P.5A]

121 Another point in the procedure is of par-
amount importance in this type of research. Fair
[[20]] general knowledge of practical field natural history can have no substitute. The investigator must have this basic knowledge, to realize the range of possibilities in the answers and identify any answers not commensurate with the actual events. This way, even without interest in the mythology, one may get on the track of a myth. Although, in
● 825 general, anthropologists seem to think that natural history knowledge of the primitive folks
121 must be ridden with the mythology and must be different than ours, my rather extensive field work persuaded me that this is not so at all. Mythology there is, if one looks for it. But the bulk of their knowledge is based on sound obervation as anyone acquainted with the natural history will readily discover. One must be able to disentangle the two qualities. That this is so is well indicated in a large number of animals where the informants simply replied to queries on this or that subject in the usual *quien sabe*. And indeed, the more obscure the subject, the more likely one got that sort of an answer.

128 In the analysis of the actual material a certain schematic programme has been followed. For the sake of convenience, material has been grouped according to the major divisions of the animal kingdom. Some may object to this saying that this is just our way of classifying animals but that aboriginal classification does not follow these lines. For certain purposes, this may be true, but for my own purpose I find my procedure more convenient. Regardless of the hypothetical native mode of classification, one may form a question.
128 How do the Seri distinguish different mammals?
825 I may say also that our own groupings are not different from those of the Seri or any other tribes. Their recognition of differences among animals may be at times hazy or from our point of view erroneous. But by and large, birds to them are birds and snakes are snakes and even within the insects, without actually naming differences, they tended to group together insects according to their order. Exceptional cases, bat, whale and the like, remain exceptions just as they were to the early Western naturalists, the 16th century Gesner or Alrovandi, for example, to whom their place in the scheme of nature was based on the analogies. But this didn't prevent these men from grouping other animals much the same as we do. In the same way, the South African Bushmen may regard Mantis as a supreme diety, but this does not prevent them to say that it is also like an insect.

128 The scheme I followed turned out useful. In the end I have obtained generalized ideas on the salient features of natural history of different animal groupings which I could compare with each other. The internal evidence is most interesting, more so that in some details it differs qualitatively and quantitatively from the materials I have gathered among other tribes.

[P. 5 B]

535 semi-darkness.

123 Soon two little boys joined the dance, stepping up and down in the sand. Lighted only by the flickering flames of the driftwood fires on the shores of this mysterious and dreaded isle, the soft murmur of the sea as a refrain to the wild chanting, the weird circling of glittering eyes, and wild dark faces, presented a scene of uncanny and savage fascination witnessed by white men probably for the first time.

[533] After each stanza there was a short rest. The singing was similar to most other tribal chanting.

582 836 622 Bob made the remark that the girl was old enough to be broken in by the old Chief. I said, "How?"

583 [929] He said, when a girl thirteen or fourteen has her menses, the Chief takes her and goes through the family act. This is called 'breaking her in'. She is then eligible for marriage. A young man desiring marriage has to purchase the girl by giving the father a boat or rifle, both being necessary to the Seri's existence and protection. At the wedding they have sort of a fiesta and much mescal is drunk, which properly solemnizes a wedding.

585 944 845 When a girl has a baby it usually comes very naturally and easily, but I remember one girl's first baby was three days in coming, and she suffered a great deal. This was on a subsequent trip. She was staying with many of her people on the mainland and someone asked them if they didn't want a doctor or other help. They said: No, they had one. It was a Medicine Man who chanted over the girl and dug hollows in the sand to fit her heels into. He said that the legs had to be kept apart. This was all he did. But ordinarily there is no trouble, and if a baby is born at noon the mother is up and doing, and cooks supper for her lord and master. The men treat their wives with kindness and each shares with the other any delicacy.

[593]

462 [303] [482] In Seriland domestic duties are reversed from the usual Indian methods. The men get the water and the women get the wood. This consists mostly of driftwood gathered along the shore, and it is a picturesque sight to see a string of women and girls bringing in loads of wood in baskets on their heads at sunset.

622 595 There are no plural marriages, but sometimes when a Chief is old, or rather when his wife is old and can have no more babies, he can take a younger woman as his wife. The present Chief is getting old now, almost too old to break in the girls, so they may get a younger man. This might be called the perquisites of office. He takes the cream.

932 825 They hunt lice in the head and eat them. This is said to increase the amorous desires. The penis of the male turtle is cut out and dried. This is pounded and pulverized and placed in the food of the women. This is said to create a desire for a man and the family act.

123 relief and contentment rose, and everybody smiled. This concoction I placed on the fire while the Indian stirred with a long stick. It took half an hour to cook into a thick sticky paste, gummy white.

[345] Meanwhile, the women vanished and returned with various vessels: greasy baskets, a black chamber pot, frying pans, ollas, stew pots, shells, any old thing---even a cuspidor. When ready, the Indians dipped the sticky mess out with a cup into the various vessels and the women and children licked it up. Some of the children covered the back of a large clam shell with the paste and then licked it off, repeating this until it was gone. Most of the people hooked their fingers into it and licked them off time and again. Any drip on the outside was carefully licked off that four gallons of goo. I do not think one single drop was lost.

126 123 As one little girl was carrying away a clam shell of paste I secured her photograph. It was a sight not soon to be forgotten, to watch these little ones dip in their fingers, mostly two, sometimes three fingers and contentedly lick them off.

Wishing to secure a photo of the Indians in Pelican skin kilts, Roberto induced Chico Romero to strip and wrap a kilt of Pelican skins around his waist. He did this and Roberto secured a good photograph. For this service, Chico demanded three oranges which he gave to his children.

By coaxing and wheedling and joking, Roberto finally persuaded a young woman to put on the Pelican kilt, and she gradually pulled off her shirt, or waist, or whatever name it goes by, and laughingly permitted it. As her brown shoulders and breasts were exposed she covered them with her arms and hands while I took the photo. I gave her some blue powder to decorate herself and a little round mirror.

372 Chico Romero made a fire drill out of a piece of dry driftwood from a cottonwood tree, and then made a fire by turning the stick between his hands. After three or four minutes the fine dust became punk and turned into a live coal. This he carefully put in some dry grass and by holding it up in the wind it was fanned into a flame. The price of this was a red bandanna.

372 773 825 The legend of Fire was told to me later by the campfire. The Seris' god sent down a fly to Seriland to show the Indians how to make fire. The fly was pointed out to me one day. It was a trifle larger than a house fly with a body of shining green and blue.

"Now," they said to me, "notice when it lands. Did you not see it take its two hands, rub them over its head and then rub them together a few times?". . ."Each time it settles it rubs its hands together, and our Indians noticed this and in this way we were taught by this little fly how to make fire by rubbing a stick between our two hands, back and forth. One fly came to earth and found something dead and he rubbed a stick between his hands and made a smoke signal

so all the other flies could see and also come to this dead thing."

A few weeks ago, Antonio Herrera had a very vivid dream. He dreamed that he was hunting in the mountains for deer and came across a cave. (These volcanic mountains are pitted with caves.) He went into the cave and saw all kinds of things dear to the heart of a Seri---plenty of rifles, lots of cartridges, knives, *manta* (unbleached cotton), necklaces, red bandannas, blue overalls, *plata*, or silver, and many other things.

When he awoke he sought his father Manuel Encinas, who is a medicine man and interpreter of dreams, to explain his dream to him. The price demanded by Manuel was six *tiras*---or 30-30 cartridges, a very high price, according to Seri standard. The explanation was this:

It was true that the cave was there and all the things in it just as seen and described by Antonio, but in order to find it he would have to fast nine days and go without water that length of time also, in the heat of summer. Then the way would appear to reach the cave. So far, Antonio has not attempted the fast.

I witnessed the operation of making a certain kind of pitch or tar which the Seris use to make the seams in their canoes or boats tight. The women pound up the dried pulp next to the outside skin of a dead *pitahalla* cactus (organ cactus). This is very dry and brown in color and the pieces are pounded up to a dry powder with a wash or shore rock in a dried deer hide. This is placed in a *batella*, or flat basket, and manipulated so that the coarse pieces come to the top and are scraped off and thrown away. The fine powder is then put in a five gallon can and some porpoise or sea-lion oil or horse oil is poured on it and stirred into a thick gummy mass. When thoroughly mixed it is put over the fire, in an olla, to boil and continually stirred for an hour or two until it is the consistency and has the appearance of coal tar. While being worked it is kept heated and applied to seams inside and outside the boat. It hardens just like tar and answers the same purpose.

Since the corn, which had kept this band of Seris in food, disappeared two days before we came, and they had barely kept going on seeds and a few fish, and they all had decided to leave camp with us in the morning---the women walking and the men and some children in boats---it was necessary to supply them with some food to take them to the hunting grounds of the *cahuasa*, or sea turtles, and land them on the Island. The *cahuasa* would furnish them meat---their favorite and national food, and the shores would supply them with clams, oysters, crabs and other sea food.

So the whole band was called around our camp and each family was furnished with two cups of corn, two of beans, some green coffee and a cup of cube sugar. For the first time our camp was free of Indians, and we ate and went to bed in peace.

The amenities of civilization were laid aside and forgotten in